

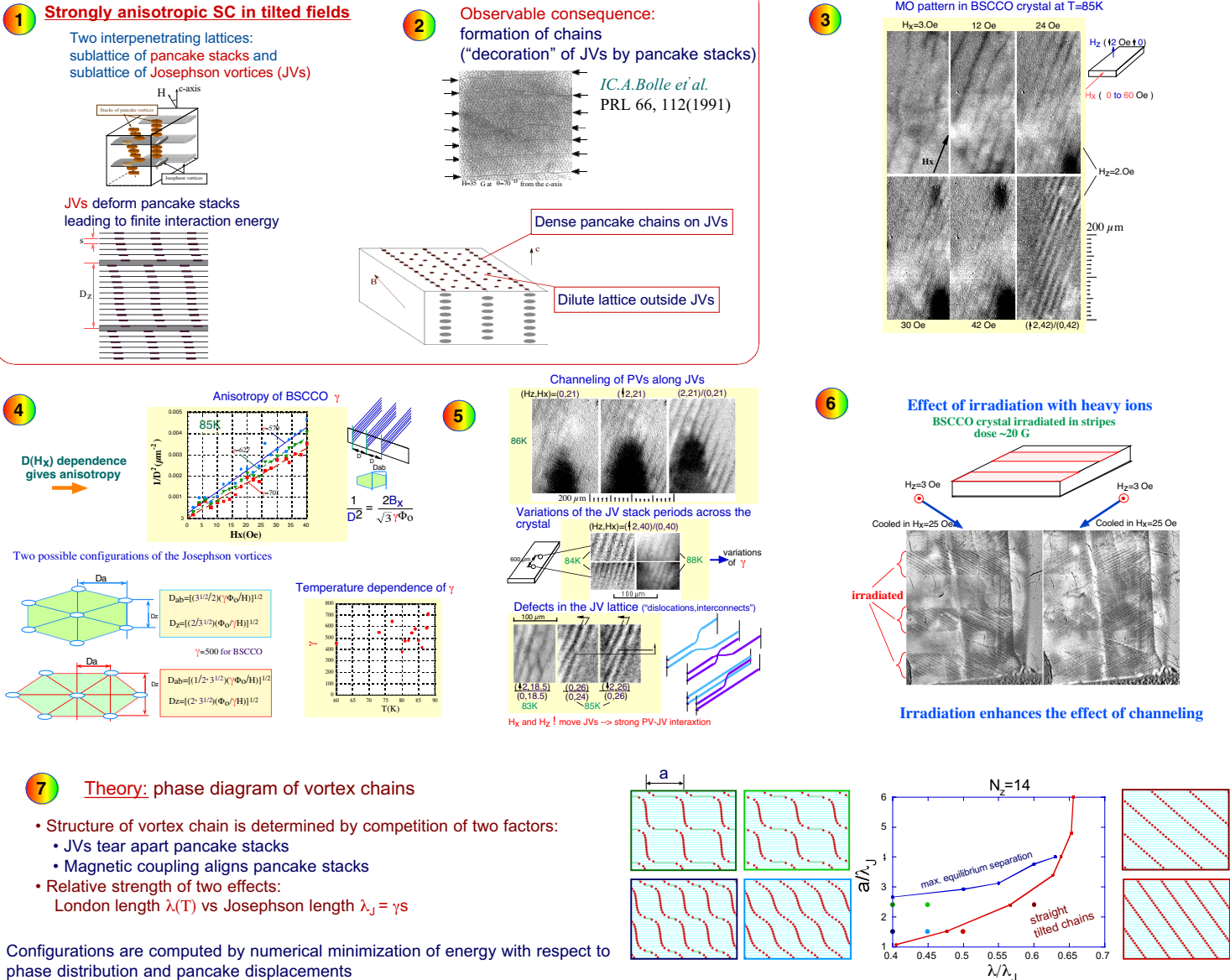
Interacting Pancake/Josephson Vortices: A New Opportunity for the Superconducting Cryo-Electronics

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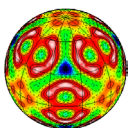
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- We investigated **interactions between Josephson and pancake vortices** in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ single crystals by **magneto-optical technique**. We found peculiarities in the pancake vortex patterns decorating Josephson vortices, which reveal **strong coupling between the two vortex subsystems**.
- The accuracy of the anisotropy estimates from the field dependencies of the Josephson vortex periods is limited by possible **transitions between equilibrium and non-equilibrium JV configurations** that show themselves in stepwise shape of $D(H)$ observed in the experiment.
- Unexpectedly, **effects** due to the Josephson-pancake vortex interactions are **enhanced by the heavy ion irradiation** as observed in periodically irradiated samples.
- We theoretically investigated the structure of **an isolated vortex chain** in the parameter space. With increasing ratio London penetration depth/ Josephson length the chain first transforms from the **crossing configuration of Josephson vortices and pancake stacks** into the **modulated tilted chains** and then transforms into the **chain of tilted straight vortices**.

BACKGROUND



V. K. Vlasko-Vlasov, A. E. Koshelev, U. Welp, G. W. Crabtree, and K. Kadowaki, Phys. Rev. B 66, 014523 (2002)



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